Perchlorate Community Advisory Group

MEETING MINUTES

Thursday, March 29th, 2007
7:00 – 9:10 pm
San Martin Lions Club Hall
12415 Murphy Ave, San Martin

I. **Pledge of Allegiance**

II. **Administrative Items**

A. Introductions were performed.

B. Attendee Sign-in Sheets: Chairperson Sylvia Hamilton noted that attendees should add their name to the sign-in sheets if they would like to receive meeting notices and other communications from PCAG.

C. Additional Agenda Items: Note

D. Open Forum: Kevin O'Day, Santa Clara County Department of Agriculture and Environmental Management, reported that there will a Great America Litter Pickup in San Martin on May 10, 2007. Litter pickup will be from 8:30 am to 11:00 am, followed by lunch at 11:30 am. Volunteers are welcome and can contact Lisa Rose at 408-282-3166.

E. 3/2/2007 Minutes: Approved as written.

III. **Presentations/Discussions**

Sylvia reminded everyone that April marks PCAG's four-year anniversary. To date, we have been able to run the meetings on an informal basis and have not had to invoke Robert's Rules of Order. She would like to keep it that way and reviewed the PCAG meeting protocol.

A. Olin Presentation – Mike Taraszki (MACTEC), John Gallinatti (Geosyntec), and Rick McClure (Olin)

Mike and John provided a report on Llagas Subbasin Investigation activities, including the basin characterization work performed in 2006, the Revised Cleanup Feasibility Study, and the Area 1 Plume Migration Control Feasibility Study. The reports are summarized below. In addition, a copy of their slides will be available at the May 4, 2007 PCAG meeting and will be posted on the Regional Water Quality Control Board and San Martin Neighborhood Alliance websites. In addition, you can request copies from Tracy Hemmeter (408-265-2600 or themmeter@valleywater.org).

1. Basin Characterization

Mike explained that 2006 Characterization Report included information on the geologic and hydrogeologic assessment, including recommendations for 2007 work, and the background assessment.

a) Geologic and Hydrogeologic Assessment: The geologic and hydrogeologic assessment is the most complete characterization of the Llagas Groundwater Subbasin ever completed to date. To date, monitoring wells have been installed at 22 off-site locations and provide nearly 200 depth-discrete sampling intervals covering the shallow, intermediate, and deep aquifer zones. In addition, cone penetrometer tests (CPTs) have been performed at 91 locations. CPTs provide stratigraphic, hydrogeological, and groundwater quality information for shallow and intermediate zones. Because the technology is based on pushing a device into the subsurface, it typically can only be used to about 200 feet before too much resistance in encountered.

Mike explained their Llagas Subbasin Conceptual Model, covering geomorphology, geochemistry, and perchlorate distribution.

(1) Geomorphology: Geomorphology is a major component of characterization. In the Llagas Groundwater Subbasin, the geomorphology is based on how creeks and streams flowed and moved over time. Coyote Creek used to flow south through the Llagas Groundwater Subbasin. There are old alluvial deposits from Llagas Creek on the west side of the valley and stacked channel deposits from Coyote Creek in the remainder of the valley. Over geologic time, the west side alluvial deposits were buried by Coyote Creek deposits. In more recent geologic time, Coyote Creek changed flow direction to the north and stacked channel deposits from Llagas Creek dominate.

(2) Geochemistry: Mike showed figures depicting the percentage of imported water in the shallow, intermediate, and deep aquifer zones. Three recharge ponds in Morgan Hill get imported water from the Central Valley Project (CVP). The shallow zone near the ponds shows nearly 100% imported water. The percent imported water decreases with depth and southerly flow. The deep zone shows up to 40% imported water near the recharge ponds. The imported water data shows the importance of imported water for groundwater management in the Llagas Groundwater Subbasin. Further, it shows the how water moves in the Subbasin.

(3) Perchlorate Distribution

(a) Shallow Zone: Onsite cleanup led to a quick drop in shallow zone perchlorate concentrations.
(b) Upper Intermediate Zone: Most of the highest concentrations are in Area 1. Water in this zone is moving very quickly, 2 – 3 feet per day.
(c) Middle and Lower Intermediate Zone: Concentrations are much lower than in upper intermediate zone, though water is moving at about the same rate.
(d) Deep Zone: Highest concentrations are in Area 1, though they are attenuating due to recharge with imported water and pumping. In

response to a question, Mike explained that groundwater in this zone does not move quickly because the gradient is flat, due to less recharge and pumping.

(e) Cross-Section View: Perchlorate concentrations are highest in Area 1.

Mike reviewed the recommendations for characterization activities in 2007. These include up to 30 CPT locations, mostly in Area III and the shallow zone before it goes dry in the summer, and deep aquifer investigation to complete characterization, including five monitoring well locations and hydraulic testing.

b) Background Assessment

Mike said they reviewed groundwater elevation contour maps from the Santa Clara Valley Water District (District), which show a groundwater divide near Cochrane Road and consistent regional groundwater flow toward the south. They reviewed groundwater quality data from Morgan Hill municipal wells and Olin samples from 39 domestic wells in the northern subbasin area. The domestic wells were located 1.5 to 3 miles north of Tennant Avenue and on the far side of recharge and municipal pumping facilities, with the conclusion that they are hydraulically isolated from the Tennant Avenue site. Mike showed the Morgan Hill municipal well data going back three years, which showed perchlorate detections above 6 ppb in only one well (Tennant Avenue) and showed lower level detections in all wells. The domestic well sampling data indicates perchlorate is highest in wells drilled along where Coyote Creek was when it flowed south. Also, the concentrations in domestic and municipal wells are similar, indicating perchlorate concentrations are stable.

Q. Why did you sample on the other side of the groundwater divide, instead of sampling to the east, west, and south?
A. Standard practice is to determine upgradient concentrations as a means of determine background concentrations. The groundwater divide is not fixed.

Q. Have imported water samples been analyzed for perchlorate?
A. Yes, with nondetect results.

Q. Based on date north of the groundwater divide, do you conclude a background concentration of 2?
A. Background appears to be between 2 and 4 ppb.

Q. If there were no Olin site, would you expect 2 ppb south of the groundwater divide?
A. Concentrations are up to 4 ppb in the Llagas Groundwater Subbasin. This is different than north of the divide, where concentration are 2 ppb.

Q. The Morgan Hill data only goes back three years. How can you assess long-term trends/plume stability on this when the release goes back 40 years? Also, you are saying background is 3 to 4 ppb. So, you can't really say what was historical?
A. Yes.

Q. Is the perchlorate in the north from UTC?
A. I won't speculate. There are many potential sources. Our task is to determine background.

Q. Since the plume is commingled, wouldn't you look at rest of plume?
A. We have defined perchlorate on the east and west as nondetect. We need to look at how the 3 ppb background in the north affects the rest of the plume.

Mike presented the following conclusions from the background assessment:

- Pervasive perchlorate detected throughout the northern Subbasin extent
- Detections are upgradient of and hydraulically isolated from the Olin site
- Concentrations range roughly from 2 to 4 ug/L [ppb]
- Highest concentrations notable close to Anderson Reservoir Dam and bedrock
- Clear evidence of background perchlorate not related to the Olin site

Mike also noted that the sources of background perchlorate are not yet identified, the District study may be able to identify sources of background perchlorate, and the San Francisco Bay and Central Coast Water Boards should discuss new data with the District.

Q. Didn't we hear a presentation about the connection between the site and the north and Morgan Hill wells?
A. Yes, in the deep zone. The low permeability of the materials in the deep zone produces a large radius of influence, though the water is moving slowly.

2. Revised Cleanup Feasibility Study

Mike explained that the objective of the Revised Cleanup Feasibility Study (FS) was to address cleanup alternatives and provide an analysis of alternatives for long-term groundwater cleanup. The FS provides the rationale for the proposed cleanup level, establishes remediation priorities zones based on perchlorate concentrations, and subdivides the subbasin into 4 areas. The "plume core," which includes the areas with perchlorate concentrations above 24.5 ppb, is fully located within Area I. Control of the plume core will allow monitored attention to remedial objectives in the rest of the plume.

Mike then discussed simulated cleanup times for different aquifer zones. They anticipate cleanup to 6 ppb in the shallow zone within 5 years, since concentrations above 6 are limited to Area 1 and groundwater moves quickly. In the intermediate aquifer zone, concentrations of perchlorate above 6 exist in all Areas. However, there are rapid rates. They anticipate that once the plume control is initiated, perchlorate concentrations will get down to 6 ppb within 12 years.

Q. Are you going to change your estimates of cleanup times based on the low rainfall?
A. The estimated cleanup times are based on average conditions, but the model will be updated with current information.

Q. I thought Olin had to clean up to background, so shouldn't the cleanup level be 2-4 and not 6 ppb?
A. 6 ppb is consistent with regulations and beneficial uses, but Hector might have something to add. Hector Hernandez, Central Coast Water Board, said they approved the feasibility study with an interim cleanup level of 6 ppb in order to get cleanup going. The Regional Water Board will re-evaluate the cleanup level as we get closer to 6 ppb. No formal cleanup level has been established.

Q. When would the contingency plan kick in? We don't want to wait until the 12 years is up to find out the plan isn't working.
A. Olin will continue to monitor conditions. Hector explained that Olin still needs to prepare the contingency plan.

Q. So, the plan is to do nothing and the perchlorate will go away in 12 years?
A. Yes, with pumping in Area 1. The deep area will take longer to clean up. However, it is important to note that the basin may behave differently with groundwater pumping for cleanup, so additional sources could show up.

Mike explained that, in the deep aquifer zone, concentrations of perchlorate above 6 can be found in Areas I, II, and III. Since the groundwater flow rates are slower, cleanup will take about 24 years.

3. Area I Plume Migration Control Feasibility Study

John explained that the objective of this study was to evaluate hydraulic containment options for the plume area where perchlorate concentrations are above 24.5 ppb, which is labeled Priority Zone A. Priority Zone A is fully located within Area I. Several remedial alternatives were considered and screened based on a number of criteria. The remedial alternatives that moved forward were:

- Hydraulic containment, ex-site treatment by ion-exchange, and on-site recharge
- Hydraulic containment, ex-site treatment by biological reduction, and on-site recharge
- Hydraulic containment, in-situ treatment by biological reduction, and on-site recharge, and
- Hydraulic containment, ex-site treatment by ion-exchange, and municipal water supply.

All the alternatives include groundwater extraction from different aquifer zones downgradient of site and pumping the water back to the site. There would be a shallow extraction well near Fisher, an intermediate zone extraction well toward the south end of Area I, and a deep extraction well in the middle of Area 1. Once the water is pumped back to the site, it will be treated and either recharged on-site or used for municipal water supply.

Q. Is biological treatment slower?
A. No. All the alternatives are viable and all have uncertainties. Uncertainties include the actual flow rate and pumping capacity.

John went on to describe critical path items associated with Area I plume migration control, which include:

- Regional Water Board concurrence with the Area I alternatives and approach
- Installation and hydraulic testing of extraction wells
- Determination of treated water disposition option
- Selection of final water treatment option

Q. What is the ballpark estimate for well installation to be completed and the system to be operational?
A. The schedule is in the report. Well installation and testing should be completed within 5 months.

Comment: Would like to see things move in parallel.

Q. How many acre-feet of water needs to be processed to achieve cleanup?
A. We don't know; it is hard to determine in the plume core.

Q. If you can estimate in other areas, why can't you estimated in the plume core?
A. Perchlorate gets caught in clay soils. The goal is containment, not cleanup, even though containment will result in cleanup.

Q. Shouldn't the recharge capacity assessment be completed first?
A. The schedule in the report shows end dates.

John discussed the next steps. The path forward includes groundwater extraction wells design and installation, determination of treated water disposition option, water treatment selection, and design, installation, and startup of the system.

4. Ion-Exchange Certification

Rick provided an updated on the status of ion-exchange "certification." The California Department of Health Services (DHS) approved the testing protocol. Sixteen systems have been installed. Three will be tested under the DHS-approved protocol. Testing began in February.

IV. Next Meeting: ~~Friday, May 4, at 2 pm.~~ (Cancelled) The Regional Water Board won't be attending. Suggested topics include septic systems, hazardous materials, and an update on produce/perchlorate research. **Next Meeting: Thursday, May 31, 2007 from 7:00 p.m. – 9:00 p.m.**

The Regional Water Board won't be attending, because Eric Gobler, Senior Water Resources Control Engineer, is retiring. Eric has been with PCAG for three of PCAG's four years. Eric noted the knowledge, interest, and dedication of the community and PCAG. He has not had another project with a more motivated and intelligent community. Eric also noted that it has been a privilege working with Olin and their consultants, even if they don't always agree.

V. Adjournment: The meeting was adjourned at approximately 9:10 pm.